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ABSTRACT

The model described here was developed for use as a program planning guide by teachers recruited from business, industry, and the professions who offer courses to employed adults seeking additional skills or improvement of their skills and job performance. Ten features of the model are listed: (1) The purpose is to improve the competencies of the learners in a specific technical area related to employment; (2) employees comprise the main clientele; (3) recruitment is an undertaking of the teacher and employer; (4) personal contacts are used in recruiting enrollees; (5) assessment of the learners' needs is done by employers using industrial guides; (6) job requirements are the main course focus; (7) subject matter is organized in an operational format; (8) courses average 60 hours; (9) firm teacher leadership and close attention to industrial standards are characteristic; and (10) program evaluation is focused on assessment of learner performance. This booklet includes description of adult learners; the implementation of the model, including making administrative arrangements, recruiting, determining instructional needs, planning the program, planning for teaching the instructional units, and using teaching tools; and learner performance evaluation. A table on when and how to use 29 different teaching tools is appended. (EM)

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Teaching Adult Education Courses: The Employee Training Model

by Joe P. Bail and Harold R. Cushman

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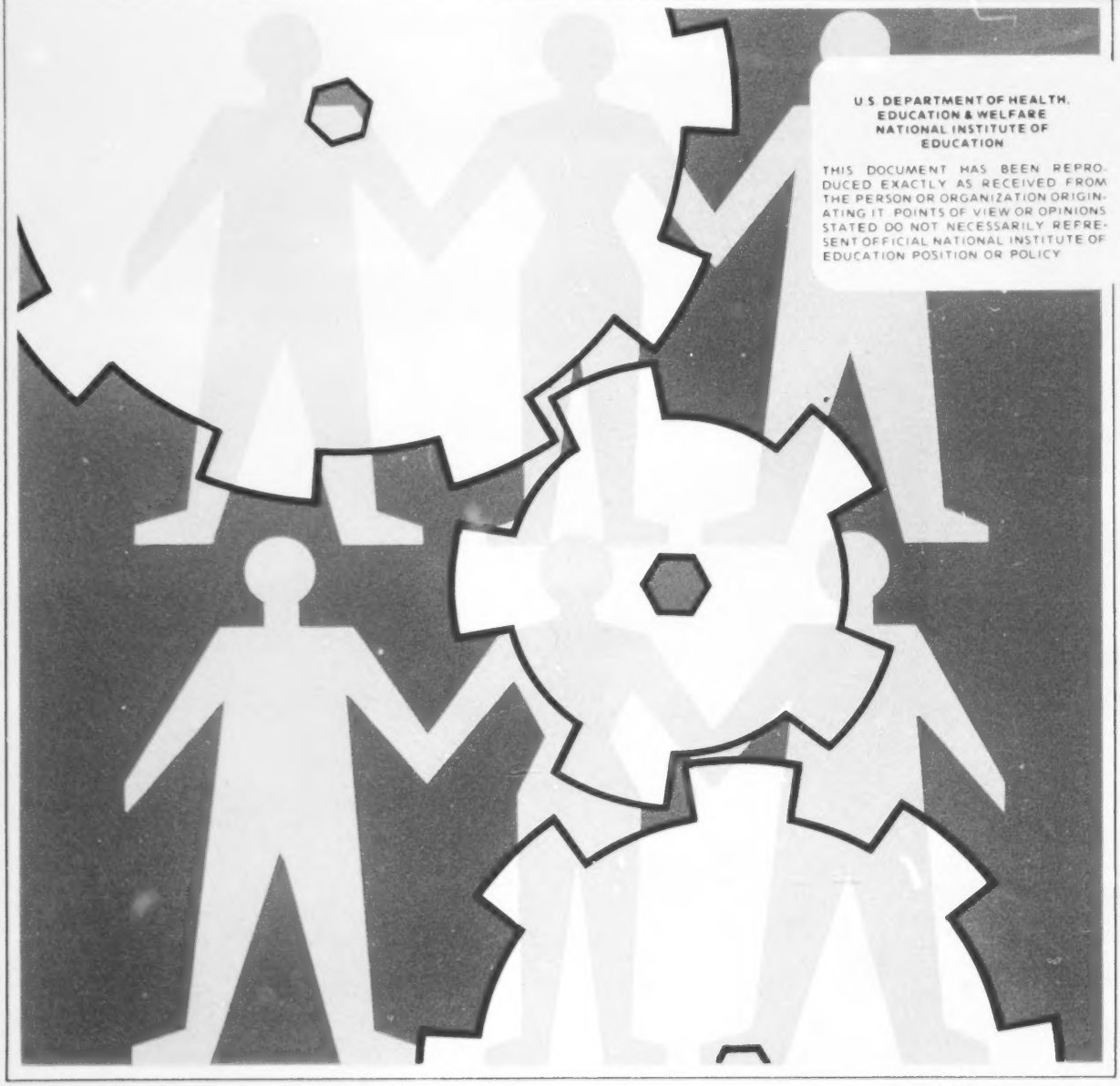

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Teaching Adult Education Courses:

The Employee Training Model

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PREFACE

Are you involved with persons seeking to gain new skills? Do you spend time wondering what is the best method to teach skills? Do you feel that you need help in planning to teach an adult education course? If your answer to all three questions is "Yes," then most likely you will want to read this bulletin. These are the questions we'll discuss that relate to an employee training type of adult course: (1) What is the content? (2) For whom was it written? (3) Why was it written? (4) How was it developed?

1. What is the Content?

This publication consists of a series of guidelines and procedures for organizing and conducting adult education courses that teach people how to improve their skills and performance on the job. In the first section we describe the unique features of the employee training model, tell you where to use it and where not to, and fill you in on some of the things that you need to know about adult learners before you start to teach them.

In the second section we deal with such aspects of an employee training course as: making administrative arrangements, recruiting, determining instructional needs, planning the instructional program, planning for teaching, and using specific teaching tools.

In the third and final section, guidelines and procedures for conducting a learner-performance evaluation are featured.

2. For Whom Was It Written?

Our intention was to address that group of teachers who offer adult education courses to employed workers seeking additional skills. These teachers are generally recruited from business and industry. The professions may also contribute to this pool of trained workers. These craftsmen and other skilled people bring excellent technical and subject matter qualifications to their teaching assignments, but they do not always possess expertise in how to teach adults. This is the audience we have addressed directly. Actually, though, we believe that all sorts of beginners in a wide variety of program settings will find this material helpful. If your adult education course attempts to teach individuals to up-grade their performance on the job, this publication was written for you.

3. Why Was It Written?

More and more people are engaged in some form of on-the-job training. Many people pursue interests that may later lead to specific vocations. Other adults up-grade marketable skills which will make them more valuable employees. Still others want to improve their decision-making and management ability. Teaching adult education courses for self-fulfillment, employee training, and business management are three different situations. We are especially concerned that beginning teachers have a chance to learn the basic rules for teaching employee training courses before they are called on to teach.

4. How Was it Developed?

Since 1972 an effort has been made at Cornell University to spell out and clarify alternative models for organizing, teaching, and evaluating adult education courses. Three objectives have been central: (a) to describe the features of alternative procedural models; (b) to try out and revise the models to fit the actual conditions in which teachers work; and (c) to place the models in the hands of the teachers who need them the most.

Phase 1. Construction and description of the alternative models.

Ideas garnered from the literature and ideas picked up from visits to 52 successful adult education courses were used to construct three models. The self-fulfillment model for use with people who want to pursue interests which will add meaning to their lives. The business management model for helping owner-operators or managers to become successfully established in a profitable enterprise. And the employee training model for improving people's specific technical competencies related to employment. Eleven experienced teachers reviewed the first draft and their ideas were used to produce a revision.

Phase 2. Try-out and revision of the models under field conditions.

Fifteen adult education teachers tried out the models. During the school year we observed the teachers using the models and listened to their comments. At the end of the year they gave us extensive feedback in the form of suggestions for improvement.

Phase 3. Putting the models in the hands of teachers who can use them.

Four publications were written as an outcome of the project:

1. *Teaching Adult Education Courses: The Self-Fulfillment Model.*
2. *Teaching Adult Education Courses: The Business Management Model.*
3. *Teaching Adult Education Courses: The Employee Training Model.*
4. *17 Teaching Tools for Adult Educators.*

All were published by the New York State College of Agriculture and Life Sciences and are available

from the Mailing Room, Building 7, Research Park, Ithaca, New York, 14853.

The *Self-Help Kit for Adult Education* including the four publications and several other references valuable for beginners is available from the Instructional Materials Service, Education Department, Cornell University, Ithaca, New York, 14853.

Also, we have presented our ideas before many groups of adult education leaders and teachers. We are available on a consultant basis for inservice education programs for adult education personnel — as time permits.

FUNDAMENTALS

The employee training model is a very useful tool for teaching adults how to improve their performance on the job. You'll find it useful in teaching persons who are seeking to up-grade or develop new skills as well as to develop greater understanding of many work processes. It is used every day in industry, business, and the military services. This publication is designed to tell you what you need to know in order to conduct an employee training course.

This section focuses on what you can expect of the model and the adults who enroll in such courses. As you read, keep your eyes open for answers to the following questions: What are the unique features of the employee training model? In what situations should you use it? Not use it? How will the adults in your class differ from the youngsters you went to school with? How will your class differ from the ones you remember from your school days? What purposes will the adults in your class have? Can your adults learn? How fast? How well? How can they help each other learn? What must you know about needs in order to use the employee training model? What must you *be* in order to teach your adults successfully? What kinds of help must you give each of your learners?

The employee training model is unique in many ways.

1. The main *purpose* of employee training courses is to *improve the competencies of the learners* in a specific technical area related to the employment of the learner.
2. *Employees* comprise the main *clientele* of such courses; although prospective employees and others frequently participate.
3. *Recruitment* for employee training courses is normally a coordinated undertaking of *the teacher and the employer.* Sometimes professional or union organizations are active participants in the recruitment process.
4. *Personal contacts* are relied on most heavily in *recruiting* prospective enrollees.

New developments in technology demand understanding of technical competencies required in the job. (Photo courtesy John Deere Corporation and Grumman Corporation.)

5. The assessment of learners' *instructional needs* is most often made by *employers* using industrial guides as the main criteria.
6. *Job requirements* provide the *main focus* of employee training courses.
7. Subject matter taught in such courses is usually *organized* in an *operational (procedural)* format.
8. Employee training courses tend to *average 60 hours* in duration distributed over 20 three-hour sessions.
9. *Firm teacher leadership* and *close attention to industrial standards* are special features of employee training.
10. *Program evaluation* of employee training is focused on the assessment of *learner performance.*

The employee training model is relatively easy to use.

1. You may find it helpful to visualize the employee training model as a form of transportation — a vehicle used by the teacher to take the learner from where he or she is to some desired place. We have done this in figure 1. We chose the two-wheel cart to symbolize this model because it was one of the earliest forms of transportation. As simple and as good as it is, it does have its limitations. For example, it doesn't float or fly very well.
2. Use this model when both your purpose in offering the course and the main purpose of your learners in taking the course is to develop new skills or up-grade old ones.

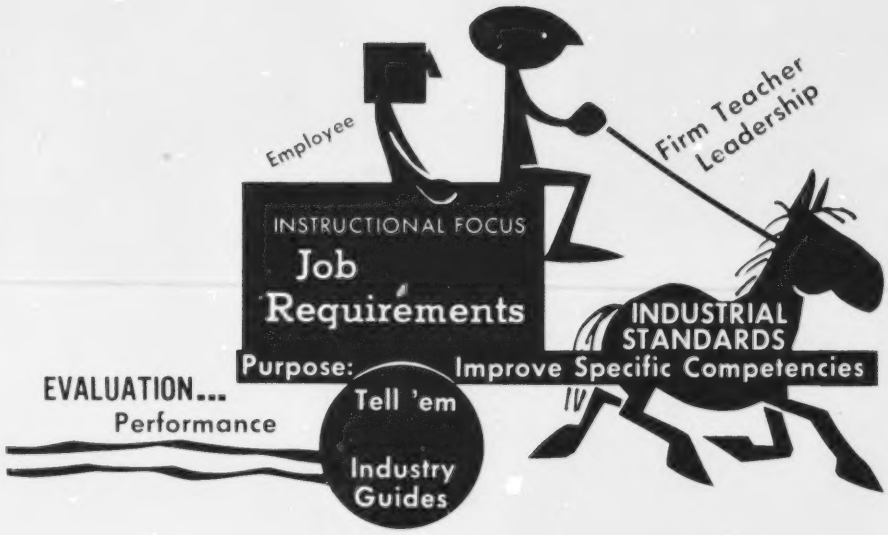

Figure 1. The employee training model.

3. Don't use the employee training model for teaching courses that focus on the self-fulfillment of the learners or on developing decision-making skills.
4. The only way you can learn how to use any tool is to study the basics and then get some first-hand experience. If you can push a two-wheeled cart you can learn to use the employment training model.
5. This model is designed with one purpose in mind — teaching persons how to improve their skills.

The adults in your employment training course differ from the students with whom you went to school (1).

1. Most of the members of your class have something at stake or they wouldn't be there. You won't need to nag them into learning once they see the connection between improved job performance and their personal goals.
2. They probably attend your class as a part-time activity.
3. You have less authority over your adult learners than your teachers had over you. They are more independent. And they'll ask "why" more often.
4. Your students have had valuable work experience. They've acquired know-how. And they've developed opinions.
5. They have more prejudices — some of which they are unaware of.
6. They are more fixed in their ways and are often harder to change.
7. They like to talk more in class — and they do.
8. Some of your students may be older than you are.
9. Your students are on their own — no need to nag them into learning.
10. And as adults they will respect your sincerity in wanting to help them. If you win their respect they'll forgive many of your shortcomings.

Your employment training class is likely to differ some from those you remember (1).

1. Learners are there to develop real skills which will enable them to perform at a higher level.
2. Your class will be less formal.
3. Memorization and paper and pencil tests will be much less important. Instead, the emphasis will be on learning by doing.
4. Your students will learn a lot from each other.
5. Your class will involve more group interaction.

Even though your purpose is to help the class members to become more skilled on the job, adults will enroll for a variety of reasons (2).

1. Some will enroll for personal reasons such as:
   a. To learn new things.
   b. To develop an avocational interest.
   c. To simply prove to themselves that they can master a new skill.
2. Others will enroll for self-fulfillment reasons such as:
   a. To fill leisure time with something meaningful.
   b. To interact with others who have similar interests.
   c. To satisfy their curiosity.

The adults enrolled in your class can learn (3,4).

1. In the first place, chronological age is only one of the many variables involved in the aging process.
2. Individual differences strongly influence learning.

3. Health, wealth, previous experience, education, and personality drastically influence the ability of people to learn.
4. Adult learning ability also varies with what is to be learned. You can be sure that most persons can learn a new skill if they set their minds to it.
5. All normal people continue to learn all of their lives.

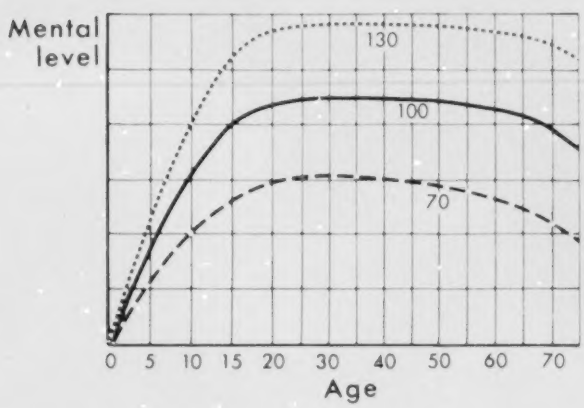

Figure 2. Growth and decline of general mental ability. Patterns of growth and decline of mental ability, as measured by general intelligence tests, are shown for a span of 75 years. Note that the horizontal scale is condensed after age twenty. The curves show the average course of change in mental level of three representative persons whose intelligence quotients (IQs) differ. The three have IQs of 70, 100, and 130, respectively. Seventy is the upper IQ limit of the least-retarded category; 100 is average; and 130 is the lower limit of the very superior classification. (Source: Sorenson (4). Reprinted with permission from McGraw-Hill.)

You can anticipate that the general mental ability of your adult class members will be entirely acceptable (5).
1. Effective mental ability probably reaches its peak in the thirties.
2. When other factors are taken into account, very little difference in mental ability is related to age within the 18-60 age range.
3. A 75-year-old person and a youngster of 12 are similar in effective mental capacity.
4. Sustained mental activity, use of imagination, reasoning, and studying new sources of information may well be essential to effective mental growth in the 20s and 30s as well as its maintenance throughout the adult years.
5. Learning may take just a bit longer for some and occur at the individual's own speed instead of at an external and fast pace.
6. Some reasons for the decline in speed of learning by elderly people are: less acute vision, less acute hearing, slower reaction time, greater reluctance to learn, and increased fear of failure.

The adults in your employment training course will help each other learn if you give them a chance.
1. Every person brings something different to the group.
2. Sharing their skills and know-how builds the self-confidence of adults in their ability to learn.
3. Adults in employment training courses can help each other by: explaining why they follow certain steps in doing a job, participating in various kinds of discussions, giving special reports, serving as resource persons in the class, and many other ways.
4. When class members are involved, the classroom atmosphere becomes more friendly, less formal, and less restrained.
5. The main thing adults contribute is their extensive experience and special skills.

Understanding the "needs" of your adult learners is a must.
1. What is meant by the term "Needs"?
   a. Maslow (6) sets forth five levels of need arrayed in the order of their likely emergence including: biological, safety, love, esteem, and self-actualization (fulfilling one's potential).
   b. The satisfaction of one level of need sets up conditions in which higher-level needs may emerge.
   c. A second interpretation of need is based on the assumption that human well-being depends on keeping a balance between internal forces produced by energy (food intake) and external conditions produced by environment (7).
   d. To keep the human system in equilibrium with external forces, certain needs must be met.
   e. A need, then, represents an imbalance or gap between the present situation or state of being (what is) and a goal (what should be).
   f. A need can be expressed in terms of a gap in a person's undertaking, attitude, or skills.
   g. It can be interpreted as desired economic, social, or environmental changes or by practices to be followed.
2. What are felt needs?
   a. A felt need exists when the individual recognizes the gap between his or her present situation and a goal.
   b. The teacher of adults can expect this individual to be aware of the need and to be motivated to tackle the problems that must be solved to fulfill the need.
   c. For example, an individual who realizes that his or her annual income is determined by skill level is likely to be motivated to learn new skills and knowledges essential to bring about a higher annual income.

3. What are unfelt needs?
   a. An unfelt need exists when someone other than the individual sees the gap between situation and what should be, even though the individual does not.
   b. The teacher of adults cannot expect this individual to be interested in solving the problems that must be solved to fulfill unfelt needs.
   c. For example, a person who does not know the different pay scales or levels of training necessary to advance on a job is unlikely to feel a need for additional skills.
4. How can unfelt needs be converted to felt needs? By helping an individual to:
   a. Recognize his or her present situation,
   b. Develop appropriate goals, and
   c. Become aware of the gap between the two and of the problems that must be solved to close the gap.
5. What are instructional needs?
   a. In those cases where the individual already possesses the prerequisite skills, understandings, attitudes, and knowledge, he or she can go ahead on and fulfill these felt needs without the aid of an instructor.
   b. On the other hand, if the individual must develop the prerequisite abilities necessary for the solution of problems and the fulfillment of needs, she or he has a need for instruction.
   c. Instructional needs, then, are the skills, understandings, attitudes, and knowledges that the teacher can help an individual to acquire in order to fulfill these needs.

As the teacher, you are the key to an effective program (8).

1. You must like adults and enjoy working with them.
2. You must know your subject matter.
3. You must be emotionally and intellectually committed to your adult class.
4. You must be willing to learn.
5. You must be enthusiastic.

Now go back to page 3. Try to answer the questions in the second paragraph. Look up the answers if you need to. Or write out the answers on a sheet of paper. Some people find that helpful. But don't leave this section until you've mastered the basics.

II. IMPLEMENTING THE EMPLOYMENT TRAINING MODEL

This section of the bulletin will tell you how to organize and conduct an adult education course that teaches people how to develop skills. We will deal with certain tasks in the order that you are likely to encounter them. Watch for the answers to the following questions. What administrative arrangements must you make in advance of your course? What's the best way for you to recruit class members? How can you use the "tell them" technique to plan your instructional program? What sort of teaching plans are most useful for teaching adults new skills? What teaching tools are most effective for teaching skills?

Industrial standards must be met if an individual is to succeed on the job. (Photo courtesy of Grumman Corporation.)

A. Making Advance Arrangements

You can rely on the Director of Adult Education to make certain routine administrative arrangements.

1. Takes charge of overall coordination of the adult education program with various community agencies and organizations.
2. Assesses the degree o community interest in various programs.
3. Gathers the program suggestions of appropriate advisory groups.

Use the mass media service of the Director of Adult Education for making public announcements of the course.

1. The Director of Adult Education coordinates all releases to the general public carrying information about the program.
2. Printed brochures describing the several program offerings are circulated widely in the community.
3. Newspapers and radio stations are used to fill "slow enrollment" courses.
4. Mass media releases feature such information as:
   - Course titles and descriptions,
   - Course locations,
   - Dates and hours,
   - Tuition and other requirements, and
   - Instructions for registration.

Recruitment for employee training courses is usually a joint undertaking between you and concerned employers.

1. Wide acquaintance with local business people and their operations in your area of specialization is a precondition for organizing an employee training course.
2. Employer support for the idea of school sponsorship of an employee training course is also a prerequisite.
3. Although employees comprise the main clientele of such courses, prospective employees and others are likely to attend.
4. Personal contacts are relied on most heavily in recruiting prospective enrolees.
5. Employers usually contact their employees. The teacher usually contacts potential employees. Professional and trade organizations may also be active in making contacts.
6. The mass media are used for making public announcements of the course.
7. Course expenses for employees are often paid by employers.

B. Determining Needs and Planning the Instructional Program

Employers usually assess the instructional needs of employees to be enrolled in your course.

1. The role of the teacher is to act as a catalyst, coordinator, and interpreter of employer assessments.
2. The improvement of employee competencies in specific technical areas related to their employment is a prime concern of employers.
3. Industrial guides and standards are useful for assessing the instructional needs of employees.
4. Two categories of instructional need are commonly identified: specific skills and related instruction topics.
5. The assessment of instructional needs is conducted before the first meeting of the group.
6. Employer assessments are effective for converting unfelt needs of employees to felt needs.

Firm teacher leadership and supervision of the learning process is a must in employee training. (Photo courtesy Boise Cascade Corporation and Grumman Corporation.)

The "tell them" technique is most commonly used in planning instructional programs for employee training.

1. Make a list of the skills and topics for related instruction which best reflects the assessment of instructional needs made by the employers.
2. Schedule each skill and topic of related instruction for specific dates taking into consideration:
   - Logical sequence,
   - Seasonality,
   - Number of meetings required for each, and
   - Urgency.
3. Provide for individual or small group interests of the potential enrollees as needed.
4. Place the tentative program in the hands of class members at the first meeting and describe procedures used for its formulation.
5. Allow minor revision of the program if the interests of the employees demand such action.
6. Plan and give instruction the first time the class meets.

C. Planning for Teaching Operational or Procedural Units of Instruction

State the TITLE of your unit in concise understandable terms that are meaningful to the learners.

1. Word the title so that it accurately describes what you plan to teach. If you plan to give instruction in only part of a complex subject matter area, you may restrict the title; for example, "Maintenance of the

Tractor After a Year of Operation" might become "Servicing the Tractor Hydraulic Implement Control System." Sometimes you will want to break a complex subject matter area into two or more smaller areas. Thus, "Diagnosis and Testing of Tractor Engines" might be broken up into: "The Seven Basic Steps in Tractor Engine Diagnoses," "Testing the Tractor Engine," and "Using Trouble-Shooting Charts."

2. Use words that are commonly spoken and understood by your learners; for example, "Maintaining the Lead-Acid Storage Battery" might become "Servicing the Battery."

3. Personalize the title of the unit if that will reflect the true nature of the teaching situation. If, for example, you plan to teach the principles and uses of three-way electrical switches by installing a yard light at Pete's Garage, you might title the unit "Wiring Pete's Yard Light."

Orient yourself to the important aspects of the SITUATION in which you will be teaching.

1. Take a minute to think about yourself in relation to the unit of instruction to be taught. Get your bearings with respect to such issues as:
   - What will this unit include? Where will it start? Where will it end?
   - What do you know about the unit already?
   - What will you need to learn in order to teach it? Where can you find out what you need to know? Who can you turn to for help?
2. Now take a minute to think about your learners and their characteristics:
   - What do they already know?
   - What abilities do they already have?
   - What is their attitude likely to be toward this subject? Will it be inherently interesting to them?
   - How does this unit relate to the motivations and lives of the learners?
3. Now turn your thoughts to the physical aspects of the situation in which you will teach:
   - Where will your teaching take place? Visualize your classroom, laboratory, shop, and other available facilities.
   - What instructional materials are available, for example, references, manuals, industry guides, bulletins, audio-visual aids, resource units, models, tools, objects, and so on.
   - What additional resources in the community might be used to supplement school resources? Are exemplary models available? Are experts available to help out?
   - How much time do you have to teach the unit? How is this time scheduled and spaced?
4. Now try to picture yourself teaching this unit to your adults in your physical set-up using the resources available to you:
   - What teaching objectives must receive top priority?
   - What format will be most useful for analyzing your subject matter?
   - How will you motivate your students?
   - What models will you provide?
   - What skills will you need to demonstrate?
   - How will you guide initial trial development of skills?
   - How will you manage practice effectively?
   - How will you provide for individual differences?
   - How will you provide for recall and help your students apply what they know to new situations?
   - How will you evaluate adult learning and provide feedback?
5. Don't write. Keep thinking until some of these issues fall in place and you can begin to picture yourself teaching this skill or topic.

State your TEACHING OBJECTIVES as specific measurable attributes you hope to observe in your learners after you have taught.

1. Teaching objectives are the WHY of your teaching.
2. The advantages of clearly-stated objectives:
   - They provide you with a sound basis for deciding on the subject matter, materials of instruction, and the teaching procedures to be employed in your teaching.
   - They enable your adult learners to establish realistic goals of their own and evaluate their progress as instruction progresses.
   - They allow you to evaluate the learning of your students in terms of specific observable behaviors.
3. Your first step is to identify by name the observable terminal behavior that you will accept as evidence that the learner has achieved.
   - Use words with specific meanings to describe what the learner will be doing when he or she is succeeding, for example, list, locate, contrast, identify, estimate, and so on.
   - Avoid words that are indefinite, denote actions that are not observable, or that can be interpreted in different ways, for example, know, understand, appreciate, enjoy, believe, grasp the significance of.
   - Now let's look at some examples of the sort of statements you will have when you finish this step:

If the title of your unit reads, "Servicing the Tractor Hydraulic Implement Control System,"
Then you might start your teaching objectives with such statements as:

1. The learner will *identify* the parts of the hydraulic implement control system.
2. The learner will *perform* the normal operations for servicing.

4. Secondly, further define the desired behavior by describing the important conditions under which the

behavior will be expected to occur. In deciding the conditions to be imposed on the learner, ask yourself three questions: What will the learner be provided? What will the learner be denied? What are the conditions under which the behavior will occur?

- Some examples of how to state conditions follow:

  Given a problem
  Given an operator's manual
  Given a standard tool set
  Given a properly functioning
  Without the aid of references
  With the aid of tools
  Without prompting

- Now let's go back to the teaching objectives we started to write previously and let's add some important conditions under which the indicated behavior will be expected to occur:

Remember, our title was "Servicing the Tractor Hydraulic Implement Control System"
Now, with conditions added, our objectives will read:

1. Given a farm tractor or a diagrammatic sketch, the learner will identify the parts of the hydraulic implement control system.
2. *Given the operator's manual, required tools, solvents, and lubricants,* the learner will perform the normal operations for servicing.

5. Specify the criterion of (minimum) acceptable performance by describing how well the learner must perform to be considered acceptable:

- Time as a criterion. Example: Given a standard set of tools, the learner must demonstrate the ability to "trouble-shoot" a tractor motor by making it run smoothly *within 30 minutes of arrival on the scene.*
- Minimum number as a criterion. Example: Given 20 tools from the following list, the learner will correctly identify *at least 15* (list follows).
- Percent or proportion as a criterion. Example: The student will define correctly at least *70 percent* of the terms in the attached list without use of references.
- Important characteristics of performance as a criterion. Example: Given oxyacetylene equipment, the learner must light the torch and adjust the flame *so that it is adequate for performing simple brazing operations.*
- Now let's complete the teaching objectives we've been working on by specifying the criterion of minimum acceptable performance:

Remember, the title of our Unit was: "Servicing the Tractor Hydraulic Implement Control System."
Now with the criterion of minimum acceptable performance added:

1. Given a farm tractor or a diagrammatic sketch, the learner will identify 10 (*out of 12*) parts of the hydraulic implement control system.
2. Given the operator's manual, required tools, solvents, and lubricants, the learner will perform the normal operations for servicing *in 30 minutes.*

Make an ANALYSIS of the OPERATIONS or PROCEDURES to be performed.

1. The *analysis* is a system for *organizing* the *content* or WHAT of your teaching.
2. You are guided in making the analysis by your teaching objectives, your knowledge of subject matter, and available technical references.
3. Much of your teaching in employee training courses will involve the development of manipulative skills.
4. The operational (or procedural) analysis is especially useful for organizing subject matter for the teaching of specific skills or procedures which involve well-defined steps or operations.

- Provides a handy guide for teacher demonstration.
- Serves as an instruction sheet for guiding initial practice of a new skill or set of procedures by the learners.

5. This type of analysis is usually organized under two headings: steps (in doing the job) and key points (and information).
6. Many operator's manuals, maintenance manuals, and textbooks contain carefully developed procedures which you can use.
7. Example (12):

Now let's go back to our unit on "Servicing the Hydraulic Implement Control System" and look at the sort of analysis you might use for organizing this particular subject matter.

EXAMPLE:	*Steps (to do the job)*	*Key Points (information)*
	1. Position lower links to lowest position.	With single-acting cylinders this will force most of the oil out of the cylinder.
	2. Remove drain plug and drain oil.	You may also have to loosen the filler plug or loosen the filler plate for faster drainage.
	3. Run engine briefly to remove oil from the pump.	Do this after the oil has stopped draining from the reservoir.

4. Remove filter cover and filter element or screen.	The procedure is the same as for replacing the crank-case filter except there is even greater need for care in preventing dirt from entering the system.
5. Clean filter housing and screen.	Wipe the housing clean with a lint-free cloth. It is important that no lint be left in the housing. Lint interferes with valve action.
6. Install filter and reassemble	The procedure is the same as for the crank case filter.
7. Reinstall drain plug.	If drain plug is equipped with a set screw check your operator's manual for the proper method of installing the drain plug and adjusting the set screw.
8. (Flush the hydraulic system.)	Some manufacturers recommend strongly against flushing. Others recommend flushing with hydraulic oil. Still others recommend flushing with diesel fuel or kerosene. *Check your operator's manual.* This is important to keep dirt from entering the hydraulic system.
9. Thoroughly clean area around filler plug or plate.	
10. Remove filler plug or plate and add the proper type of hydraulic oil.	
11. Start engine and operate lift through several cycles.	This helps assure that all air has been removed from the system.
12. Recheck oil level and add oil as necessary.	
13. Replace filler plug or plate.	
14. Clean hydraulic breather.	Not all tractors have a breather on the hydraulic housing. If there is one, use the procedures applicable for crankcase breathers. The only exception is for edge-wound paper filters which should be cleaned with greaseless cleaning fluid such as used for clothing.

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8. Before we leave analysis, you may wish to reexamine your teaching objectives in the light of your increased familiarity with the subject matter you plan to highlight. Want to change them? Go ahead! It's your teaching plan!

Select the TEACHING PROCEDURES you will use in teaching your unit. Teaching procedures are the WHO, WHERE, WHEN, and HOW of your teaching.

1. First, let's get in mind the great variety of teaching procedures commonly used in teaching operational or procedural units of instruction.

Shop or laboratory techniques:
Demonstration
Supervision of practice
Individual projects
Group projects
Use of job sheets
Educational technology:
Slides and film strips
Sound motion pictures
Overhead projector
Audio tape recorder
Single-concept films

Teacher-centered techniques:
Lecture
Teacher explanation
Team teaching
Problem-solving
Individual instruction

Visual aids:
Charts and posters
Flannel and magnet boards
Flip chart
Chalkboard
Models

Techniques for using community resources:
Field trip
Resource Persons
Learner collection of information

2. Secondly, let's examine the teaching tasks that are vital for teaching operational or procedural units.

- Communicate teaching objectives to the class members.
- Maintain motivation of the learners.
- Demonstrate skills and procedures.
- Guide initial trials of learners.
- Manage practice effectively.
- Evaluate student performance.
- Provide feedback on progress.

3. Select the teaching tools which you believe will best enable you to carry out each of the teaching tasks you plan to perform. Some criteria for your consideration in doing this are:

- Using teaching procedures known to be effective with adults, for example, demonstrations, practice, use of educational technology, use of visual aids, field trips, and resource persons.
- Avoid, whenever possible, procedures less popular with adults, for example, long lectures, audio-visual aids that are hard to see or hear, recitation, supervised study, and written examinations.
- Provide opportunity for class members to participate in giving instruction at a level consistent with their capabilities. Every class will have members who are capable of giving demonstrations, assisting with individual instruction, planning and conducting field trips, and so on.
- Use a variety of procedures.
- Select teaching procedures which are workable in view of time available and the setting in which you will use them.
- Above all, keep your eye on your teaching objectives and select procedures which will result in the kinds of behavior changes you have in mind for your learners.

4. Example:
Now let's take a look at some teaching procedures which might be effective for teaching our unit on "Servicing the Hydraulic Implement Control System."

Teaching Procedures:
First Hour

a. Introduce the unit by stressing the importance of proper servicing of the hydraulic implement control system.
   (1) Field dust, rust particles, moisture from condensation, and metal particles all work their way into the hydraulic system.
   (2) Contaminants of these types seriously damage the surfaces of the working parts causing leaks, improper operation, and finally failure to operate.
   (3) Annual servicing is the only cure for this problem.
b. Describe your objectives in teaching this unit, placing emphasis on what the enrollees are to learn, the conditions you will impose on them, and your minimum criterion for acceptable performance.
c. Using appropriate charts supplied by tractor manufacturers, point out the parts of the hydraulic implement control system.
d. Go over the chart again and have the class recall the names of the parts in unison.
e. Divide the class into small groups and have each person find the actual parts on a tractor.
f. Demonstrate the proper procedure for servicing the hydraulic implement control system. Stress the steps and key points as you proceed.

Second and Third Hours:

a. Divide class into small groups and have each person perform the steps in the approved procedure.
b. Evaluate performance of the class members as they work and provide feedback on progress.

List the MATERIALS OF INSTRUCTION needed for each class session.

1. Most of us find it useful to list the materials needed for each class session. A glance at this list will serve to remind you of the things you need to have available for the upcoming teaching sessions.
2. Example: Now, to finish our teaching plan dealing with "Servicing the Tractor Hydraulic Implement Control System."
Teaching Materials:
Clean cloths
Container with cleaning solvent
Box end wrenches
Container for old oil
Flushing oil
Hydraulic oil
Charts of implement control system
Mimeo diagram of implement control system

D. Using Teaching Tools Effectively

You already have a good start on using teaching tools effectively. You are aware of the teaching tasks that are vital for teaching operational units. And you

know how to select appropriate teaching tools for performing each task. What you probably need now is to develop skill in using each teaching tool effectively.

To get you started we have developed a "Master Key to Adult Education Teaching Tools." Perhaps a few words about how we created it will help you understand what it is and how it can help you.

1. First we classified the teaching tools commonly used in teaching adults into six categories:
   - Group interaction techniques
   - Visual aids
   - Education technology — sometimes called educational hardware
   - Teacher-centered techniques
   - Techniques for using community resources
   - Shop or laboratory experiences
2. Next we made a list of teaching tasks that each teaching tool is well-suited for. Diagrams showing teaching and learning interactions should help you estimate the physical situation.
3. Then we wrote a brief description of how to go about using each tool properly. These descriptions aren't exhaustive. But they do give you the main steps to follow, and at the end of each description we cited the best references we know of for finding out more about each specific teaching tool.
4. And last of all we tied it all together by collecting all of the references cited in the "Master Key..." in a *Self-Help Kit for Adult Education.* If you missed where to send for this, look in the preface.
5. Our hope is that you will be courageous. Use the "Master Key..." to help you select and use appropriate teaching tools for performing each of your teaching tasks. Don't be afraid to experiment. Most of them are easy to use.

On-the-job training is an essential element in the employee training model. (Photo courtesy Agway Corporation.)

E. Giving Individual Instruction

Use individual instruction for specific purposes that are difficult to achieve by other means.

1. To assist enrolees in assessing their instructional needs.
2. To follow-up on group instruction by helping the learners apply problem-solving abilities to their own business situations.
3. To help enrolees solve problems which will not be dealt with in group instruction.

Make appointments for individual on-job instruction at least a week in advance.

1. For a specific hour.
2. On a specific day.
3. At a specific place.
4. For a specific purpose.

Prepare thoroughly for giving individual instruction.

1. Review your record of previous individual instruction visits.
2. Double-check to see if you have followed through on promises made.
3. Analyze the problem to be solved.
4. Determine the teaching procedures to be used.

III. EVALUATING THE EMPLOYEE TRAINING COURSE

Consider performance testing for evaluating your employee training course.

1. Performance testing is concerned with the observable results or products of your course as evidenced by the learners.

Performance testing is a major component of the evaluation process. (Photo courtesy Bethlehem Steel Corporation.)

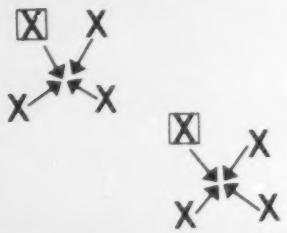
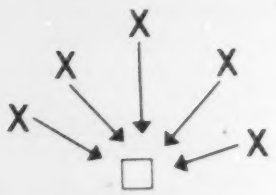
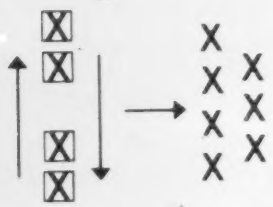
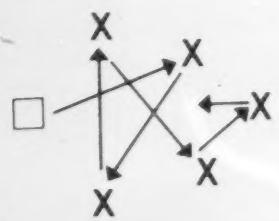
2. All result-centered approaches to evaluation ask two questions:
   - What is the purpose of the course?
   - How well has that purpose been achieved?
3. When applied to the employee training course these questions become:
   - What skills and related information did you attempt to teach the learners?
   - How well did you succeed?
4. Three assumptions underlie performance testing as an evaluation technique:
   - The instructional needs of the employees enrolled have been accurately assessed by the employers.
   - Planning for the course has been sharply focused on the instructional needs of the learners.
   - The teaching has emphasized the development of specific skills and related information needed by the employees.
5. Performance testing has several advantages as an evaluation technique.
   - It judges the course on the same basis that employers and employees will judge it; the performance of the enrollees.
   - It pinpoints strengths and weaknesses in the main product of the course; the skills and related information learned by the enrollees.
   - It allows the teacher to evaluate and adjust teaching procedures accordingly as he or she goes.

The evaluation of your employee training course using performance testing proceeds by five distinct steps:

1. The purpose of the program is identified and defined operationally by listing the specific competencies (skills and related information topics) to be taught in the course.
2. Behavioral objectives are written for each teaching plan specifying:
   - The observable terminal behavior you will accept as evidence that the learner has achieved.
   - The important conditions under which the behavior will be expected to occur.
   - The criterion of minimum acceptable performance on which you will judge the learner.
3. The teacher teaches the unit of instruction as planned.
4. Learner performance is assessed in the context of the behavioral objectives.
5. The evaluation is a continuous proces.

Table 1. Master key to adult education teaching tools

A. Group interaction techniques

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Buzz session 	Maintain motivation. Provide for individual differences.	Divide into small groups (about 5 or 6). Sit around tables. Appoint discussion leader and reporter for each group. Explain the topic. Discuss for under 15 minutes. Pull groups together. Get report from each group. End with general discussion. (12, 13, 14)
Brainstorming 	Provide for individual differences.	Problem is sighted. Group members express ideas on the subject. All ideas are accepted and recorded. Recorded ideas are then considered and discussed. (12, 13, 14)
Debate 	Maintain motivation. Help individuals apply knowledge and skills in new situations.	Select the issue of debate. Prepare room. Divide the group into those pro and con. Select a moderator. Alternate speeches pro and con. Stage rebuttals pro and con.
General discussion 	Maintain motivation. Provide for individual differences.	Arrange seating so all can be seen and heard. Select a discussion leader. Maintain informality. Stay on the subject. Direct comments to entire group. Summarize. (12, 14)

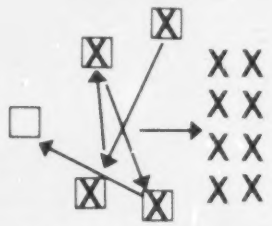
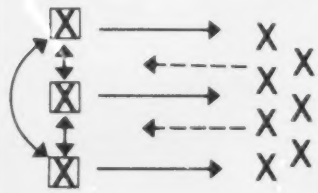
X Student

X Student in special role

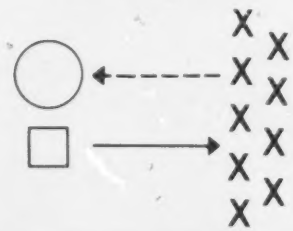
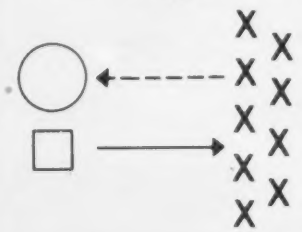
□ Instructor

→ Speech

A. Group interaction techniques (Cont'd.)

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Panel discussion 	Present information in a logical sequence.	Decide on topic, select moderator, choose three to five panel members with differing opinions and experiences. Maintain informality, inviting comments from audience. (12, 13)
Role playing 	Maintain motivation. Provide exemplary models. Demonstrate skills. Guide initial trials.	Select two to four players and explain their roles and attitudes in seclusion from audience. Prepare audience for what they will observe. Stop role playing when interest is high. Discuss. (12, 13)

B. Visual aids

Charts and posters 	Maintain motivation. Present information in a logical sequence. Smaller groups.	Select only clearly supportive materials. Place chart or poster prominently. Introduce at proper time. Stand to the side. Explain chart or poster clearly. (15a, 15g, 15i)
Flannel and magnet boards 	Maintain motivation. Present information in a logical sequence. Demonstrate skills. Smaller groups.	Prepare all materials to be used beforehand. Practice presentation. Work standing to the side. Talk facing the class. Introduce materials at proper time. Explain clearly. (15b, 15j)

X Student

Student in special role

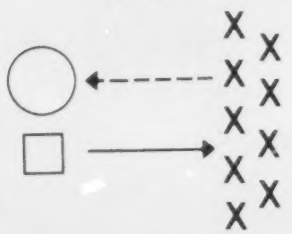
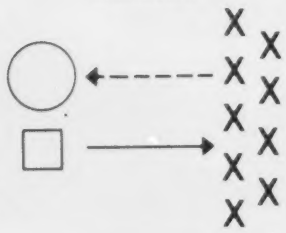
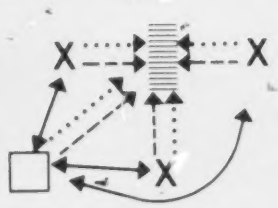
Instructor

→ Speech

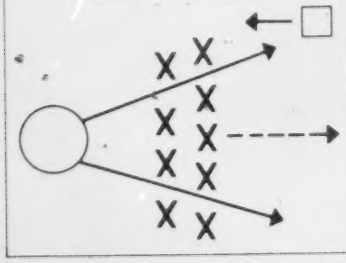
--→ Visual or sight

Visual aids

B. Visual aids (Cont'd.)

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Flip chart 	Maintain motivation. Present information in a logical sequence. Provide for recall. Smaller groups.	Prepare materials in proper sequence beforehand or practice illustrations. Situate flip chart prominently. Stand to the side. Introduce materials at proper time. Clearly explain. (15g, 15j)
Chalkboard 	Maintain motivation. Present information in a logical sequence, emphasizing particular points.	Eliminate glare. Erase irrelevant materials beforehand. Predraw (print) complicated diagrams; cover, uncover at proper time. Stand to the side. Face the class. Use pointer. (14, 15g, 15j)
Models 	Maintain motivation. Provide exemplary models. Present information in a logical sequence. Demonstrate skills.	Be familiar with models. Plan clear remarks. Use logical sequence. Label the model. Situate it prominently. Clearly explain. Use a pointer. Answer questions. (14)

C. Educational technology

Slides and film strips 	Maintain motivation. Provide exemplary models. Present information in a logical sequence.	Select pertinent materials. Preview. Prepare room. Gain knowledge of projector's use. Plan presentation and discussion. Show slides leading discussion as you proceed. (1, 14, 15d, 15e, 15f)

X Student

□ Instructor

→ Speech

--→ Visual or sight

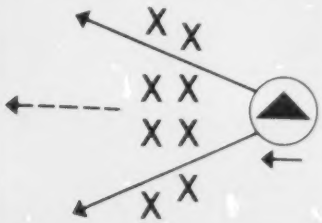
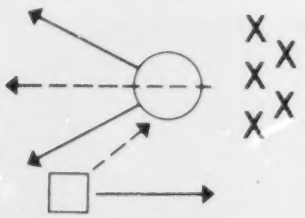
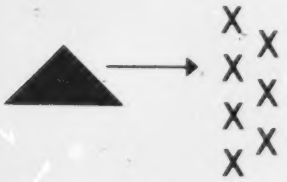
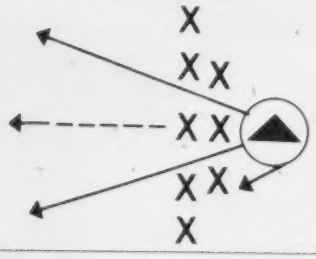
○ Visual aids

▯ Object(s) usually used for demonstrating – e.g. models

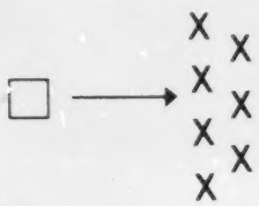
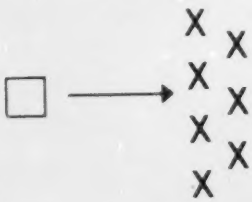
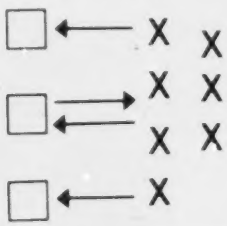
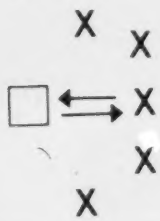
···→ Manipulation or use of other senses (touching, smell, taste)

Projection

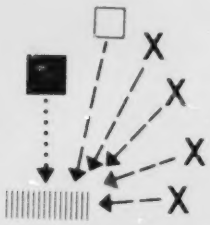
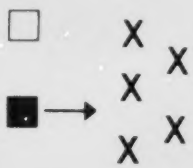
C. Educational technology (Cont'd.)

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Sound and motion pictures 	Maintain motivation. Provide exemplary models. Present information in a logical sequence.	Select films carefully. Gain complete knowledge of projector use. Preview film. Prepare equipment and location for projection. Orient students. Show film. Follow up with discussion. (1, 14)
Overhead projector 	Maintain motivation. Present information in a logical sequence.	Gain knowledge of projector use. Plan out presentations. Rehearse. Allow class participation. Vary your techniques. (14, 15e, 15j)
Audio tape recorder 	Maintain motivation. Present information in a logical sequence.	Gain knowledge of equipment. Plan. Select appropriate materials. Preview tapes. Check proper volume. Prepare listeners, clarify misconceptions. Present tape. Discuss. (1)
Single-concept films 	Maintain motivation. Present small amount of information in a logical sequence.	Select appropriate film or films. Gain complete knowledge of projector for use. Preview carefully. Prepare classroom. Plan lesson and discussion. Show film at appropriate time during session. Review and discuss the concept involved. (1)

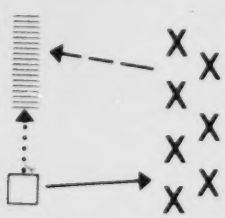
D Teacher-centered techniques

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Lecture 	Present information in a logical sequence. Demonstrate skills. Communicate Teaching objectives.	Select appropriate topics. Organize and sequence the lecture. Be concise. Make it real and above all, interesting. (12, 13, 14)
Teacher explanation 	Present information in a logical sequence. Demonstrate skills. Guide initial trials.	Formulate clear statements. Stay on the topic. Observe for feedback. Summarize.
Team teaching 	Demonstrate skills. Guide initial trials. Manage practice effectively. Provide for individual differences.	The team of from two to six plan together. One teacher conducts the lesson while other teachers or aids answer students' questions or provide individualized instruction. The team evaluates together. A team may also be formed using students with special course-related skills. (12)
Problem-solving 	Present information in a logical sequence. Guide initial trials. Provide for recall. Apply knowledge to new situations.	Select problem area and define a problem statement. State decisions to be made. Identify alternative courses of action. Weigh alternatives on basis of pertinent factors. Formulate solution. (12)
Individualized instruction	Provide for individual differences in current knowledge and ability.	Determine pupil's special needs. Plan instruction. Provide materials and adequate study area. Instruct. Answer all questions. Evaluate. Plan new instruction. (1, 14, 16)

E. Techniques for using community resources

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Field trip 	Maintain motivation. Provide exemplary models. Demonstrate skills. Provide for individual differences.	Coordinate plans with all concerned in advance of trip. Arrange for transportation. Clearly explain the objectives to the class and host. Review and evaluate the experience. (1, 13, 14)
Resource person 	Maintain motivation. Provide exemplary models. Demonstrate skills.	Contact resource person in advance and plan the presentation. Prepare the meeting room in advance. Preview the class. Conduct the class. Review the experience. (1, 14)
Learner collection of information	Maintain motivation. Provide for individual differences. Provide for recall. Help individuals apply knowledge to new situations.	Outline the problem. Guide information collection. Explain. Give it meaning. Question. Evaluate.

F. Shop or laboratory experiences

Demonstrations 	Provide exemplary models. Present information in a logical sequence. Demonstrate skills.	Instructor selects materials and location. Presents the demonstration stressing key points and safety factors in under 15 minutes. Audience imitates demonstration with guidance from instructor. (12, 14)

X Student

□ Instructor

■ Outside instructor or resource person

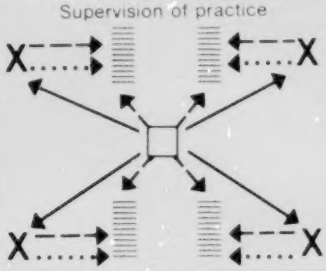
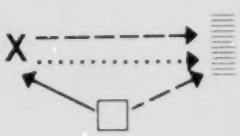
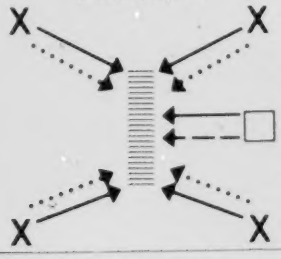
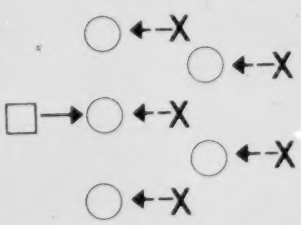
→ Speech

→ Visual or sight

····→ Manipulation or use of other senses (touching, smell, taste)

▤ Object(s) usually used for demonstrating — e.g. models

F. Shop or laboratory experiences (Cont'd.)

Teaching tools	*Teaching tasks well-suited for*	*How to go about it*
Supervision of practice 	Guide initial trials. Manage practice effectively. Provide for individual differences. Provide feedback evaluation.	Become proficient in the task you will oversee. Organize to insure safety. Provide instruction as needed. Provide feedback. (14)
Individual projects 	Provide for individual differences. Help apply knowledge and skills to new situations.	Provide for equipment and supplies. Guide project selection. Have learner draw a sketch and make up a bill of materials. Provide individual instruction as needed. Monitor to insure safety. Cooperative evaluation of project with students. (16)
Group projects 	Maintain motivation. Help individuals to apply knowledge and skills to new situations.	Provide for equipment and supplies as well as interpersonal relations. Guide project selection. Provide individual and group instruction as needed. Monitor to insure safety. Cooperative evaluation with group. (1)
Use of job sheets 	Communicate teaching objectives to class. Present information in a logical sequence. Guide initial trials.	Teacher selects a task and prints a sheet of sequenced instruction for completing the task. Students must be capable of performing each step of outline. Prepare equipment. Distribute outline. Provide supervision and instruction. (14)

X Student

□ Instructor

→ Speech

○ Visual aids

–→ Visual or sight

····→ Manipulation or use of other senses (touching, smell, taste)

▤ Object(s) usually used for demonstrating — e.g. models

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